

CLAIMS

What is claimed is:

1. A color image forming apparatus which, in a sequential order for each of plural colors of a composite color image, charges plural photosensitive bodies, exposes electrostatic latent images on the plural photosensitive bodies, develops latent images on the photosensitive bodies into color images, and transfers the color images to sequentially form images of each of the plural colors one on another to form the composite color image and transcribing the composite color image onto a printing medium, the color image forming apparatus comprising:
plural charging units which perform the charging process for each of the plural colors;
plural exposing units which perform the exposing process for each of the plural colors;
plural developing units which perform the developing process for each of the plural colors;
plural transfer units which perform the transfer process for each of the plural colors; and
a power supply unit which supplies power to the plural charging units, the plural developing units, and the plural transfer units.
2. The color image forming apparatus of claim 1, wherein, a charging power supply unit branches an output from a single charging power transforming unit and supplies the branched power to each of the plural charging units.
3. The color image forming apparatus of claim 1, wherein a developing power supply unit supplies power to the plural developing units, and comprises a single developing power transforming unit and plural developing voltage dropping members disposed between the developing power transforming unit and each of the developing units.
4. The color image forming apparatus of claim 3, wherein each of the plural developing units comprise feeding rollers which supply a developer, and wherein feeding voltage dropping members are disposed between the feeding rollers and the plural developing voltage dropping members, respectively.

5. The color image forming apparatus of claim 1, wherein a transfer power transforming unit supplies power to the plural transfer units, and wherein plural transfer voltage dropping members are disposed between the transfer power transforming unit and the respective transfer units, respectively.

6. The color image forming apparatus of claim 3, wherein the developing voltage dropping members are zener diodes.

7. The color image forming apparatus of claim 6, wherein the plural transfer units are four transfer units, the voltages applied to the four transfer units differ, and four transfer voltage dropping units, one for each of the four transfer units are used.

8. The color image forming apparatus of claim 6, wherein the plural transfer units are first through fourth transfer units, the voltages applied to the four transfer units differ, and three transfer voltage dropping units, one for each of the second through fourth transfer units, are used.

9. The color image forming apparatus of claim 8, wherein a power level supplied by the transfer power transforming unit to the transfer unit where the highest voltage is applied is fixed.

10. The color image forming apparatus of claim 5, wherein the developing voltage dropping members are zener diodes.

11. The color image forming apparatus of claim 1, wherein the power transforming unit is a DC-DC converter that controls the output voltage by controlling pulse width.

12. The color forming image apparatus of claim 11, wherein the DC-DC converter includes

- a pulse width control unit which modulates a pulse width of a high DC voltage;
- a voltage transforming unit;
- a high voltage output unit;
- a rectifying unit which feeds the high DC voltage to the transfer unit; and

a voltage recognition circuit which detects the level of output high DC voltage and returns to the pulse width control unit,

wherein the pulse width control unit, the voltage transforming unit, and the high voltage output unit convert a DC input into a High DC voltage, and

wherein the pulse width control unit modulates based on level returned from the voltage recognition circuit.

13. A color image forming apparatus which forms a composite color image on a printing medium by transferring and fixing a composite color image from a transfer medium onto the printing medium, comprising:

plural photosensitive bodies arranged on a side of and in contact with the transfer medium in an order, for bearing an image on a surface thereof;

plural transfer units each disposed opposite to the side of the transfer medium on which the photosensitive bodies are arranged, for transferring the image from the surface of each of the plural photosensitive bodies onto the transfer medium by pressing the transfer medium into contact with the surfaces of the plural photosensitive bodies;

plural charging units each disposed on a side of each of the plural photosensitive bodies, for charging the surface of each of the plural the photosensitive bodies;

plural developing units each disposed on a lower side of each of the plural photosensitive bodies, for developing electrostatic latent images formed on the surface of each of the plural the photosensitive bodies;

a power transforming unit for modulating externally-supplied power to a power suitable for the plural transfer units, the plural charging units and the plural developing units, and which controls an output voltage in accordance with an operation environment; and plural voltage dropping members each disposed between the power transforming unit and the plural transfer units and between the power transforming unit and the developing units, for dropping a voltage output from the power transforming unit into a power suitable for the plural transfer units and the plural developing units.

14. The color image forming apparatus of claim 13, wherein the plural developing units comprise developer feeding rollers for feeding the developers, and between the plural developer feeding rollers and the plural voltage dropping members are disposed feeding voltage dropping members.

15. The color image forming apparatus of claim 14, wherein the power transforming unit is a DC-DC converter which controls output voltage by controlling pulse width.

16. The color image forming apparatus of claim 14, wherein the voltage dropping members are zener diodes.

17. An image forming device, comprising:
a plurality of photosensitive bodies, one for each color of a composite color image;
a plurality of charging units which charge a surface of each of the plurality of photosensitive bodies so that an electrostatic latent image is formable thereon;
a plurality of developing units which develop electrostatic latent images formed on the surfaces of the plurality of photosensitive bodies;
a plurality of transfer units which transfer developed electrostatic latent images onto a transfer medium;
a charging power supply unit which powers the plurality of charging units;
a developing power supply unit which powers the plurality of developing units;
and
a transfer power supply unit which powers the plurality of transfer units.

18. The image forming device of claim 17, further comprising a plurality of transfer voltage dropping units each of which is disposed between the transfer power supply unit and respective ones of the plurality of transfer units and which drop a voltage of a transferring power supplied by the transfer power supply unit to each of the plurality of transferring units to yield respective transferring voltage level gaps in the transferring power supplied to each of the plurality of transfer units.

19. The image forming device of claim 18, wherein the plurality of transfer voltage dropping units are zener diodes.

20. The image forming device of claim 17, further comprising a plurality of transfer voltage dropping units each of which is disposed between the transfer power supply unit and a transfer unit and which drop a voltage of a transferring power supplied by the transfer power supply, wherein the plurality of transfer units include an upstream transfer unit and downstream transfer units, and wherein the plurality of transfer voltage dropping units are respectively disposed between the transfer power supply unit and the transfer units and which drop the voltages of the power supplied to each of the downstream transfer units to yield respective transferring voltage level gaps in the transferring power supplied to each of the plurality of transfer units.

21. The image forming device of claim 20, wherein the plurality of transfer voltage dropping units are zener diodes.

22. The image forming device of claim 17, further comprising a plurality of developing voltage dropping units each of which is disposed between the developing power supply unit and the respective ones of the plurality of developing units and which drop a voltage of a developing power supplied by the developing power supply unit to the plurality of developing units to yield respective developing voltage level gaps in the developing power supplied to each of the plurality of developing units.

23. The image forming device of claim 22, wherein each of the plurality of developing units uses a color developer having a different charge to mass ratio and the developing voltage delivered to each of the plurality of developing units differs depending on the color developer used by the respective developing units.

24. The image forming device of claim 22, wherein the plurality of developing voltage dropping units are zener diodes.

25. The image forming device of claim 22, wherein each of the plurality of developing units includes a developing roller and a feeding roller which feeds developer onto a surface of the developing roller.

26. The image forming device of claim 25, wherein each of the feeding rollers are respectively powered by the voltages output by the plurality of developing voltage dropping units.

27. The image forming device of claim 26, further comprising a plurality of feeding voltage dropping members each of which is disposed between each of the respective ones of the plurality of developing voltage dropping units and a feeding roller and which drop a voltage supplied to each feeding roller to yield respective feeding voltage level gaps in the feeding power supplied to each of the feeding rollers.

28. The image forming device of claim 27, wherein the developing voltage is variable by a developing power transforming unit and when the developing voltage is varied the developing voltage gaps are maintained.

29. The image forming device of claim 17, further comprising a plurality of developing voltage dropping units each of which is disposed between the developing power supply unit and respective ones of the plurality of developing units and which drop a voltage of a developing power supplied by the developing power supply, wherein the plurality of developing units includes an upstream developing unit and downstream developing units and the plurality of developing voltage dropping units respectively drop the voltages of the power supplied to each of the downstream transfer units to yield respective developing voltage level gaps in the developing power supplied to each of the plurality of developing units.

30. The image forming device of claim 29, wherein each of the plurality of developing units uses a color developer having a different charge to mass ratio and the developing voltage delivered to each of the plurality of developing units differs depending on the color developer used by the respective developing units.

31. The image forming device of claim 29, wherein the plurality of developing voltage dropping units are zener diodes.

32. The image forming device of claim 29, wherein each of the plurality of developing units includes a developing roller and a feeding roller which feeds developer onto a surface of the developing roller.

33. The image forming device of claim 32, further comprising a plurality of feeding voltage dropping members each of which is disposed between each of the respective ones of the plurality of developing voltage dropping units and a feeding roller and which drop a voltage supplied to the associated feeding roller to yield respective feeding voltage level gaps in the feeding power supplied to each of the feeding rollers.

34. The image forming device of claim 33, wherein the developing voltage is variable by a developing power transforming unit and when the developing voltage is varied the developing voltage gaps are maintained.

35. An image forming device, comprising:
a plurality of photosensitive bodies, one for each color of a composite color image;
a plurality of charging units which charge a surface of each of the plurality of photosensitive bodies so that an electrostatic latent image is formable thereon;
a plurality of developing units which develop electrostatic latent images formed on the surfaces of the plurality of photosensitive bodies;
a plurality of transfer units which transfer developed electrostatic latent images onto a transfer medium; and
a power transforming unit, which powers the plurality of charging units, the plurality of developing units, and the plurality of transfer units.

36. The image forming device of claim 35, wherein the power transforming unit converts externally-supplied one of DC power or AC power to a DC power suitable to operate the developing unit.